

**COTTON QUANTITY, QUALITY AND VALUE: A
COMPARISON OF HAND AND MECHANICAL
HARVEST RESULTS FROM A LARGE SCALE
SOUTH TEXAS TEST**

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Abstract

Many variety tests are carried out each year with results reported from samples that are ginned with laboratory machines as opposed to results from commercial gins, mainly due to the scale of these tests. This paper compares quantity, quality and value results from a large scale test of both laboratory ginned cotton and commercially ginned cotton.

Material and Methods

Two sub-tests were established on King Ranch Farms, Kleberg County, Texas in 1998 to evaluate cotton varieties. One test consisted of 8 transgenic B.t. varieties and the other test consisted of 15 varieties; two transgenic B.t. cultivars (DPL 32B and PM 1215B) were included in both tests. Varieties were replicated 3 times in a RCB design in 36-row by 5,775 ft plots (15.1 acres). Rows were spaced on 38-inch centers. Three John Deere 7300 MaxEmerge 12-row air planters were used to plant 4.4 seed/row ft on 11 and 12 Mar in a field that had been in sorghum in 1997.

Seventeen John Deere pickers including 4 and 6 row machines were used to harvest plots on 5-8 Aug. Seed cotton from each plot was stored in separate modules. A seed cotton sample was obtained from each corner of all modules to determine lint turnout percentage and fiber characteristics. These samples were processed on a 10-saw Eagle Laboratory machine and lint was sent to the International Textile Center, Lubbock, Texas for fiber analysis. Module weights were then used to determine lint yield based on percentage turn-out achieved in the laboratory gin but before yields were calculated, the lab gin turnout readings were uniformly adjusted to match achievement of the commercial gin. In addition, modules were weighed and ginned separately by variety so that fiber characteristics and quality factors could also be measured on all bales processed by commercial ginning (these samples were in addition to single samples from the modules). All data were analyzed by ANOVA and LSD.

Discussion

Table 1 lists data for micronaire, strength, length and yield from the transgenic B.t cotton variety comparison based on hand samples taken from each module and commercial gin recaps. Lint yield differences for varieties were calculated from commercial ginned recaps and were significantly different (LSD=53.6 lb). Statistically significant differences were found among varieties for all fiber characteristic parameters but strength. Laboratory ginned samples had micronaire values that were higher than those commercially ginned recaps for three of the eight varieties. Two of these three differences were great enough to change the micronaire loan premiums, based on the 1998 Crop Upland Cotton Loan Premium and Discount Schedule (Table 2). Length values for all the laboratory ginned samples were greater than for those ginned commercially. In each of these cases, the difference changed staple length be at least one class. Strength values for five of the laboratory ginned samples was greater than the commercially ginned cotton. Only one of the strength premiums was different from the commercial ginned recaps (Table 2).

Selected fiber characteristics based on hand samples from modules and commercially ginned yield data for the 15-entry test containing 13 conventional and 2 transgenic B.t. cotton cultivars are provided in Table 3. Statistical differences were found for every parameter measured. The probability level and LSD (P=0.05) are given for each parameter. Only 27.2 lb lint/acre was required to statistically separate lint yields (P=0.05). Laboratory ginned samples had higher micronaire values for 10 of the 15 cultivars relative to the commercial gin recap micronaire values. The laboratory ginned micronaire values would have led to larger discounts for two cultivars and a loss of premium for one cultivar. Laboratory ginned samples had greater length values for 13 of the 15 cultivars relative to the commercial gin recap length values. The laboratory ginned length values would have led to smaller discounts for nine cultivars and a larger discount for one cultivar. Laboratory ginned samples had greater strength values for 7 of the 15 cultivars relative to the commercial gin recap strength values, with one strength value the same in both cases. The laboratory ginned strength values would have led to larger premium for one cultivar and a larger discount for one cultivar.

Summary

Laboratory ginned samples from a pair of two-large scale variety tests had longer length measurements than the corresponding commercially ginned cotton a high percentage of the time. Longer length values would have overstated the value for most cultivars. Discrepancies between laboratory ginned samples and corresponding commercial ginned recaps

led to less frequent differences in discounts for micronaire and strength measurements.

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Table 1. Transgenic B.t. cotton variety fiber characteristics and lint yield for laboratory ginned and commercially ginned cotton, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Fiber characteristics						Yield (lb lint/ac)
	Mic-L	Mic-C	Lgth-L	Lgth-C	St-L	St-C	
DPL 35B	4.5	4.17	0.99	0.97	26.2	25.7	401
DPL 33B	4.4	4.27	0.99	0.96	25.1	25.2	392
DPL 32B	4.1	4.25	0.97	0.95	24.8	24.8	381
DPL 20B	4.1	4.17	0.99	0.97	25.2	24.9	370
PM 1560B	4.5	4.46	0.99	0.96	26.6	26.1	359
DPL 50B	4.0	4.14	1.02	1.00	25.9	24.9	340
PM 1215B	3.8	4.15	1.02	0.99	27.0	26.1	312
PM 1330B	4.0	4.07	1.00	0.98	25.2	25.4	273
LSD (P=0.05)	.419		.029		NS		53.6
P>F	.0267		.0253		.1186		.0022

Mic-L = lab ginned cotton micronaire, Mic-C = commercial ginned cotton micronaire, Lgth-L = lab ginned cotton length, Lgth-C = commercial ginned cotton length, St-L = lab ginned cotton fiber strength, St-C = commercial ginned cotton fiber strength.

Table 2. Transgenic B.t. cotton variety loan premiums and discounts based on fiber characteristics and for laboratory ginned and commercially ginned cotton, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Loan Premiums/(Discounts)						
	Mic-L	Mic-C	Lgth-L	Lgth-C	St-L	St-C	Color-C
DPL 35B	0	20	-240	-325	5	5	31-2
DPL 33B	0	20	-240	-325	0	0	31-2
DPL 32B	20	20	-325	-450	0	0	31-2
DPL 20B	20	20	-240	-325	0	0	31-2
PM 1560B	0	0	-240	-325	5	5	31-2
DPL 50B	20	20	-170	-330	5	0	41-2
PM 1215B	20	20	-85	-240	5	5	31-2
PM 1330B	20	20	-170	-400	0	0	41-1

Mic-L = lab ginned cotton micronaire, Mic-C = commercial ginned cotton micronaire, Lgth-L = lab ginned cotton length, Lgth-C = commercial ginned cotton length, St-L = lab ginned cotton fiber strength, St-C = commercial ginned cotton fiber strength, Color-C = commercial ginned cotton color grade.

Table 3. Cotton variety fiber characteristics and lint yield for laboratory ginned and commercially ginned cotton, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Fiber characteristics						Yield (lb lint/ac)
	Mic-L	Mic-C	Lgth-L	Lgth-C	St-L	St-C	
SG 125	5.0	4.87	1.01	0.98	26.0	25.5	439
PM H1560	5.2	5.00	1.02	0.97	27.0	26.2	432
DPL 5690	4.8	4.55	0.97	0.95	26.8	26.6	425
FM 989	4.4	4.39	0.98	0.96	26.3	27.0	409
STV 474	5.0	4.90	0.97	0.98	26.1	25.8	409
FM 832	4.2	4.04	1.05	1.03	28.2	28.8	406
DPL 5690RR	4.7	4.46	0.98	0.95	26.1	27.0	405
DPL 32B	4.3	4.27	0.97	0.96	24.6	25.3	398
DPL 5409	4.6	4.43	0.99	0.96	25.1	25.1	383
STV 373	4.4	4.45	1.00	0.99	24.2	24.3	383
DPL 50	4.7	4.63	1.00	0.98	24.4	24.5	374
PM 1215B	4.1	4.19	1.04	1.00	26.0	26.4	341
UAP 201	4.3	4.34	0.99	0.97	24.7	24.5	338
PM H1215	4.3	4.49	1.01	1.00	26.9	26.8	333
TX 300	4.6	4.50	0.95	0.97	26.1	25.4	261
LSD (P=0.05)	.382		.048		1.507		27.2
P>F	.0000		.0098		.0002		.0000

Mic-L = lab ginned cotton micronaire, Mic-C = commercial ginned cotton micronaire, Lgth-L = lab ginned cotton length, Lgth-C = commercial ginned cotton length, St-L = lab ginned cotton fiber strength, St-C = commercial ginned cotton fiber strength.

Table 4. Cotton variety loan premiums and discounts based on fiber characteristics and for laboratory ginned and commercially ginned cotton, King Ranch Farms, Kleberg County, TX, 1998.

Variety	Fiber characteristics						
	Mic-L	Mic-C	Lgth-L	Lgth-C	St-L	St-C	Color-C
SG 125	-295	0	-240	-325	5	5	31-2
PM H1560	-295	-295	-170	-400	5	5	41-3
DPL 5690	0	0	-325	-450	5	5	31-2
FM 989	0	0	-325	-325	5	5	31-1
STV 474	-295	0	-325	-325	5	5	31-2
FM 832	20	20	120	-85	5	15	31-2
DPL 5690RR	0	0	-325	-450	5	5	31-2
DPL 32B	0	20	-325	-325	0	0	31-2
DPL 5409	0	0	-240	-325	0	0	31-2
STV 373	0	0	-240	-240	0	0	31-2
DPL 50	0	0	-240	-325	0	0	31-2
PM 1215B	20	20	-170	-330	5	5	41-2
UAP 201	0	0	-240	-325	0	0	31-2
PM H1215	0	0	-330	-330	5	5	41-2
TX 300	0	0	-525	-400	5	0	41-2

Mic-L = lab ginned cotton micronaire, Mic-C = commercial ginned cotton micronaire, Lgth-L = lab ginned cotton length, Lgth-C = commercial ginned cotton length, St-L = lab ginned cotton fiber strength, St-C = commercial ginned cotton fiber strength, Color-C = commercial ginned cotton color grade.